

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the Application.

1. (Cancelled)
2. (Currently amended) The process as claimed in claim 25 ~~claim 1~~, wherein the redox system further comprises catalytic amounts of a polyvalent metal ion which may occur in a plurality of valency states.
- 3 – 5 Cancelled
6. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein 2-hydroxyphenylhydroxymethylsulfonic acid or the sodium salt thereof, 4-methoxyphenylhydroxymethylsulfonic acid or the sodium salt thereof, 2-hydroxy-2-sulfinatoacetic acid or the disodium or zinc salt thereof or 2-hydroxy-2-sulfinatopropionic acid or the disodium salt thereof is the reducing agent.
7. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein the amount of oxidizing agent added is in the range of from 0.02 to 3% by weight, based on the total weight of all monomers, and wherein the amount of reducing agent added is in the range of from 0.02 to 3% by weight, likewise based on the total weight of all monomers.
8. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein the reducing agent comprises a mixture of disodium 2-hydroxy-2-sulfinatoacetate in an amount in the range of from 50 to 60% by weight, sodium sulfite in an amount in the range of from 30 to 35% by weight and disodium 2-hydroxy-2-sulfinatoacetate in an amount in the range of from 10 to 15% by weight, based on the total weight of the mixture.

9. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein the oxidizing agent and the reducing agent are fed in ~~in~~-succession in separate feeds as components for the aftertreatment of the polymer dispersion.
10. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein at least one component is fed in by metering.
11. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein at least one of the components is fed in ~~in~~ portions.
12. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein first the oxidizing agent and then the reducing agent are added.
13. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein the reducing agent is fed in by metering.
14. (Original) The process as claimed in claim 2, wherein the metal ions for the aftertreatment of the polymer dispersion are added after the oxidizing agent and the reducing agent.
15. (Original) The process as claimed in claim 2, wherein the metal ions for the aftertreatment are added after the oxidizing agent and together with the reducing agent.
16. (Original) The process as claimed in claim 2, wherein the polyvalent metal ions used are iron ions.
17. (Currently Amended) The process as claimed in claim 25~~claim 1~~, wherein the temperature during the aftertreatment is in the range of from 20 to 100°C.
18. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein the aftertreatment is carried out under a pressure in the range of < 1 MPa.

19. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, wherein the aftertreatment is carried out at a pH in the range of from 2 to 9.
20. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, which is carried out using a polymer dispersion having a viscosity in the range of greater than or equal to 100 mPa.s.
21. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, which is carried out using a polymer dispersion which contains, as polymerizable monomers, esters of vinyl alcohol and monocarboxylic acids having from 1 to 18 carbon atoms.
22. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, which is carried out using a polymer dispersion which contains, as polymerizable monomers, esters of α,β -monoethylenically unsaturated mono- and dicarboxylic acids, alkanols having from 1 to 12 carbon atoms, or nitriles of α,β -monoethylenically unsaturated carboxylic acids.
23. (Currently Amended) The process as claimed in claim 25 ~~claim 1~~, which is carried out using a polymer dispersion which contains, as polymerizable monomers, aromatic or aliphatic α,β -unsaturated, unsubstituted or halogen-substituted hydrocarbons.
24. (canceled)
25. (New) A process for reducing the amount of residual monomers in aqueous polymer dispersions by chemical aftertreatment, comprising: treating an aqueous polymer dispersion containing residual monomers with a redox system which consists essentially of
- a) from 0.005 to 5% by weight, based on the total weight of all monomers used for the preparation of the polymer dispersion, of at least one oxidizing agent based on an organic peroxide from the class consisting of the

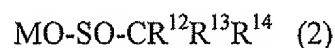
a1) a perester which is tert-butyl perbenzoate, tert-butyl peroxy-3,5,5-trimethylhexanoate, tert-butyl peroxy-2-ethylhexanoate, cumyl peroxyneodecanoate, 1,1,3,3-tetramethylbutyl peroxyneodecanoate, tert-butyl peroxyneodecanoate, 1,1,3,3-tetramethylbutyl peroxy-pivalate, tert-butyl peroxyneohexanoate, tert-amyl peroxy-pivalate, tert-butyl peroxy-pivalate, 1,1,3,3-tetramethylbutylperoxy-2-ethylhexanoate, tert-amyl peroxy-2-ethylhexanoate, tert-butyl peroxydiethylacetate, tert-butyl peroxyisobutyrate, tert-butyl peroxyacetate or tert-amyl peroxybenzoate, or

a2) a percarbonate which is 1-(2-ethylhexanoylperoxy)-1,3-dimethylbutyl peroxy-pivalate, di(2-ethylhexyl) peroxydicarbonate, 2,5-dimethyl-2,5-di(2-ethylhexanoylperoxy)hexane, tert-amylperoxy 2-ethylhexyl carbonate, tert-butylperoxy isopropyl carbonate or tert-butylperoxy 2-ethylhexyl carbonate, or

a3) a perketal which is 1,1-di(tert-butylperoxy)-3,3,5-trimethylcyclohexane, 2,2-di(4,4-di(tert-butylperoxy)cyclohexyl)propane, 1,1-di(tert-butylperoxy)cyclohexane, 2,2-di(tert-butylperoxy)butane, 3,6,9-triethyl-1,4,7-triperoxy-nonane or 3,6,9-trimethyl-1,4,7-triperoxy-nonane,

and

b) from 0.005 to 5% by weight, based on the total weight of all monomers used for the preparation of the polymer dispersion, of at least one reducing agent from the group consisting of the sulfinic acids and the salts thereof having the structure



in which M is hydrogen, NH^4 , a monovalent metal ion or one equivalent of a divalent metal ion of the groups Ia, IIa, IIb, IVa or VIIIb of the Periodic Table of the Elements, in which $\text{R}^{12} = \text{OH}$, $\text{NR}^{15}\text{R}^{16}$, in which R^{15} and R^{16} , independently of one another, are hydrogen or $\text{C}_1\text{-C}_6\text{-alkyl}$,

in which $\text{R}^{13} =$ hydrogen or an alkyl, alkenyl, cycloalkyl or aryl group, it being possible for these groups to have 1, 2 or 3 substituents which, independently of one another, are selected from $\text{C}_1\text{-C}_6\text{-alkyl}$, OH , $\text{O-C}_1\text{-C}_6\text{-alkyl}$, halogen and CF_3 ,

in which $\text{R}^{14} = \text{COOM}$, SO_3M , COR^{15} , $\text{CONR}^{15}\text{R}^{16}$, COOR^{15} , in which M, R^{15} and R^{16} have the meanings stated above, or, if R^{13} is aryl, this may be unsubstituted or substituted as stated above, R^{14} is also H, and the salts thereof,

and optionally sodium sulfite and/or sulfonic acid derivates which cannot eliminate any formaldehyde.

26. (New) The process as claimed in claim 25, wherein said oxidizing agent is tert-butyl perbenzoate, tert-butyl peroxy-3,5,5-trimethylhexanoate or tert-butyl peroxy-2-ethylhexanoate.

27. (New) The process as claimed in claim 25, wherein said oxidizing agent is tert-butyl perbenzoate.

28. (New) The process as claimed in claim 25, wherein said oxidizing agent is tert-butyl perbenzoate, tert-butyl peroxy-3,5,5-trimethylhexanoate and tert-butyl peroxy-2-

ethylhexanoate, tert-butyl peroxyneoheptanoate, tert-amyl peroxy-pivalate, tert-butyl peroxy-pivalate, tert-amyl peroxy-2-ethylhexanoate, tert-butyl peroxydiethylacetate, tert-butyl peroxyisobutyrate, tert-butyl peroxyacetate or tert-amyl peroxybenzoate, or the

a2) said percarbonate is tert-amylperoxy 2-ethylhexyl carbonate, tert-butylperoxy isopropyl carbonate or tert-butylperoxy 2-ethylhexyl carbonate, or the

a3) said perketal is 1,1-di(tert-butylperoxy)-3,3,5-trimethylcyclohexane, 2,2-di(4,4-di(tert-butylperoxy)cyclohexyl)propane, 1,1-di(tert-butylperoxy)cyclohexane or 2,2-di(tert-butylperoxy)butane.

29. (New) The process as claimed in claim 25, wherein said oxidizing agent is tert-butyl perbenzoate, tert-butyl peroxy-3,5,5-trimethylhexanoate and tert-butyl peroxy-2-ethylhexanoate, tert-butyl peroxyneoheptanoate, tert-butyl peroxy-pivalate, tert-butyl peroxydiethylacetate, tert-butyl peroxyisobutyrate or tert-butyl peroxyacetate or

a2) said percarbonate is tert-butylperoxy isopropyl carbonate or tert-butylperoxy 2-ethylhexyl carbonate, or

a3) said perketal is 1,1-di(tert-butylperoxy)-3,3,5-trimethylcyclohexane, 2,2-di(4,4-di(tert-butylperoxy)cyclohexyl)propane, 1,1-di(tert-butylperoxy)cyclohexane, or 2,2-di(tert-butylperoxy)butane.